affected and, though it was obvious that food was the cause of the outbreak, it was difficult to establish that any food had been taken on board other than in London.

The first such outbreak appears to have been reported by Peffers *et al.*[8]

With longer incubation periods or with flight times considerably less than four hours it is perfectly possible for a planeload of passengers to be scattered to their various destinations before the characteristic symptoms of diarrhoea and vomiting appear.[9] Few doctors are likely to inquire from patients whether they have recently been involved in a plane journey and no single public health agency is likely to be able to assemble the available epidemiological evidence to relate it to a particular plane journey in sufficient time for all the contacts to be traced. If food poisoning on aeroplanes is more common than the occasional outbreak on board would suggest, there is a real possibility of an outbreak occurring in an airport soon after the aeroplane has landed. Sporadic outbreaks have already occurred[10] and the possibility of a whole planeload of passengers being involved increases daily. With the larger aircraft now in service this would present an unusual medical emergency of disaster proportions which would be likely to outstrip the resources even of an airport such as Heathrow.

Conclusion

The international health problems presented by an age of high speed travel are once again outpacing the control facilities available at major passenger ports of entry, such as airports. This is not a new phenomenon, but is part of a continuing historical process which has been unfolding over the last 150 years. The time would seem to be appropriate for a major review of existing practices in the light of the problems now emerging and the new epidemiological pattern which is evident both nationally and on a worldwide basis.

Proposals to abolish all health controls on passengers at ports of entry are attractive, certainly in economic terms. Less than 5% of all passengers at London (Heathrow) Airport are now subject to health control and of these only a minute proportion require the skills of doctors or highly trained health personnel. The costs and practical problems of providing a separate health control facility at all times are both rapidly increasing. Some countries now combine port health screening with other control facilities, training all immigration officers in the basic techniques and supporting them with a nucleus of health staff. Such a system has much to commend it.

The most profitable area of approach would seem to be the development of a better intelligence system for following up passengers at their destinations. The present system, relying as it does upon passengers voluntarily presenting a card to any doctor who attends them, is insufficient. Many of these cards are subsequently collected from the floor of the customs hall where they have been discarded by passengers. The ability to relate particular patients to individual flights and to identify other persons on those flights at their several destinations would seem to be an essential step and would allow control measures to be mobilized quickly at the point where they are most effective—that is, where the patient or contact is currently living. The possibility of extending such a system to include other disease groups could then be explored. There are many difficulties in implementing such a scheme, not least from commercial interests. Some will no doubt argue that such a system represents an intrusion on privacy, but society must ultimately decide whether it wishes to continue, at increasing cost, a progressively less effective system; to abandon it entirely with the attendant public health risks which would be involved; or to improve, in the light of current conditions, a system which has served it well. The medical profession has a duty to give informed advice to such a debate.

The opinions expressed in this paper are my own and do not necessarily represent the views of any official organization with which I have been associated. I am grateful to Dr. P. R. Cooper for his helpful support and advice, and I would like to thank Mrs. P. Finch and Miss D. Thear for secretarial help.

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Home Accidents to Children under 15 Years: Survey of 910 Cases

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Summary

Out of 910 accidents sustained by children under 15 seen at the casualty department of a local hospital 678 (74·5%) were to children under 5 years of age. Boys were more prone to accidents than girls, and in preschool children the highest incidence of accidents was among the 2-to 3-year-olds of both sexes. Social class had no significant bearing on the accident rate. The fact that the average size of families with children under 5 was higher among families living in council houses than among those living in private houses appeared to have some bearing on the higher incidence of accidents among children under 5 living in council houses. There appeared to be no peak month when accidents were more frequent and the incidence of accidents was not significantly high on any particular weekday. In 95% of the cases one or both parents were in charge of the child at the time of the accident.

Cuts were the most common types of accident followed

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by falls and poisoning. Among other accidents crushed fingers were as frequent as burns. A total of 62 patients (6·8% of all cases) were admitted as inpatients. Of the actual causes of the cuts and falls playing, fighting, and misbehaving were the most common followed by falling from beds, chairs, etc. While there is a need for health education programmes to draw attention to the specific dangers evidenced there clearly will always be home accidents.

Introduction

For some years the casualty department of the local children's hospital has informed us of all home accident cases attending there for treatment. At first routine follow-up was undertaken by a health visitor but later health visitor assistants took over this work.

For two years from January 1971 we used a questionnaire to obtain information on non-fatal accidents to children under 15. As well as obtaining details of the accident and type of injury sustained we inquired into household composition, social grouping, type of housing, previous accidents, etc.

Since the survey related only to home accidents to children who attended hospital, either as outpatients (most cases) or as inpatients, we know nothing of the number who sustained injuries which did not warrant hospital attention. Furthermore, in 1971 we were informed of only 349 such home accidents. This was due to changes in the organization of the hospitals in Norwich with the phasing out of the children's hospital casualty department. We are satisfied that the 1972 figure (561) is a true figure of home accidents to children under 15 years in Norwich who found their way to hospital.

The coefficient of correlation for the age distribution between the 1971 and 1972 series was 0·98 and that for the age and sex distribution (males) was 0·95. Moreover, there was no significant difference in the social grades of the pattern. Thus except for analysis of the incidence per unit of population, which is based on the 1972 figures, the results for the two series have been combined.

Incidence

Previous studies of home accidents have shown a high incidence among preschool children. McQueen,[1] for example, reported that the under-5s, who formed 9·1% of the population of Aberdeen, were the victims in 35% of the accidents, the rate for that age group being 55·6 per 1,000. Tyser,[2] in his survey of home accidents reported by some general practitioners in East Anglia, estimated home accidents rates per 1,000 of the total population as 7·2 for children under 5 and 4·1 for those aged 5 to 14.

Without much additional information, including sex and age compositions of the various populations, one cannot be dogmatic but it appears that Tyser's figures for the under-15s are probably of the same order as ours (table I) and McQueen's. Gardner,[3] in a survey of all home and garden accidents (excluding fractures) in Barrow in Furness, found that just over 25% of the accidents occurred in the 0 to 4-year age group, and a B.M.A. report[4] records this group as being the victims of 24% of all home accidents.

TABLE I—*Accident Rate in relation to Age and Size of Population, 1972*

Age (Years)	No. of Accidents	Size of Population	Rate per 1,000
0–4	405	8,825	45·9
5–9	107	8,895	12·0
0–14	49	8,355	5·9
Total	561	26,075	21·5

In our series the rate for accidents to children under 5 was 45·9 per 1,000. Thus one in every 22 children under 5 in Norwich attended hospital for a home accident in 1972 (table I). Closer analysis (table II) showed the 2- to 3-year-olds to be the most frequent victims. In fact, in 1972 one out of every 15 2-year-olds in Norwich visited hospital after a home accident. Of the children aged under 15 years who attended the casualty department after a home accident only 6·8% were admitted as inpatients. This may well suggest that many of the injuries were of a relatively minor nature and perhaps in other areas would have been treated at home or by the family doctor.

In our study boys were more numerous than girls—57% and 43% respectively. This difference is highly significant statistically (S.E. 2·3). In McQueen's[1] study the proportions were 55% and 45% and in the B.M.A. survey[4] 59% and 41%.

In 678 (74·5%) of the total of 910 accidents in this series the victims were children of preschool age (table II). As noted above, the highest incidence occurred in the 2- to 3-year-olds, the figures being 121 boys and 89 girls. Thus this group accounted for 31% of all cases in preschool children and 23% of all cases in the study.

TABLE II—*Accidents to Children by Age and Sex Distribution*

Age (Years)	M.	F.	Total		
			No.	%	
0–	29	28	57	6·3	
1–	103	64	167	18·4	
2–	121	89	210	23·0	74·5
3–	81	65	146	16·0	
4–	68	30	98	10·8	
5–	26	20	46	5·1	
6–	18	13	31	3·4	
7–	25	18	43	4·7	18·6
8–	10	15	25	2·8	
9–	11	13	24	2·6	
10–	12	9	21	2·3	
11–	3	9	12	1·3	
12–	4	6	10	1·1	6·9
13–	3	5	8	0·9	
14–	6	6	12	1·3	
Total	520	390	910	100·0	

Social Factors

Class.—Statistical examination of accidents to children by social class (Registrar General's classification) showed that the relative incidence in all social grades was the same (table III). This is in contrast to the findings of McQueen in Aberdeen. He found that just over 35% of all employed men were in social classes IV and V but that their children had about 49% of the accidents. At the time of McQueen's study only 26·5% of the population of Norwich were in social classes IV and V (1961 Census).

TABLE III—*Distribution of Accidents according to Social Class*

Social Class	Accidents		Local Population
	No.	%	%
I	29	3·2	3·2
II	65	7·1	7·4
III	594	65·3*	62·2*
IV	147	16·2 \} 24·2	15·1 \} 25·0
V	73	8·0 \}	9·9 \}
Not classified	2	0·2	2·1
Total	910	100·0	100·0

*Difference not statistically significant (S.E. 1·6).

Marital State of Families.—There appeared to be no greater liability to accident in one-parent families. These constituted 8% of all the families in our series, which is comparable to the 8·6% for the population of Norwich as a whole.[5] Heycock,[6] when investigating accidental poisoning in Sunderland, found that 7·8% of cases occurred in single-parent families.

Housing.—Though about equal numbers of houses were occupied by families with children under 5 in the private and municipal sectors there were more children in the municipal sector—that is, the average size of the families was higher. This could well have influenced the higher incidence of home accidents among children under 5 in that sector.

Previous Accidents

At the time of the follow-up visit the parent or person in charge was asked to recall details of any previous accidents to the child or to other children in the family. In 279 cases (30·7%) a previous accident to the same child was reported but in only 96 (10·5%) was an accident to another child in the family recalled. This low incidence must in some way be affected by memory but the result clearly suggests the existence of the accident-prone child.

Weather

An attempt was made to see if there was any relation between weather and the occurrence of accidents. Many mothers, however, when interviewed were vague about the weather at the time of the accident.

Timing of Accidents

Analysis of the monthly incidence of accidents showed no clear pattern. Furthermore, no particular day of the week was associated with a high incidence either to preschool children or to schoolchildren. This is in contrast to the findings of McQueen[1] and Gardner.[3]

TIME OF DAY

In any household where there are children there are likely to be periods of peak activity coinciding with mealtimes and the husband and children going to and returning from work and school. It seemed possible that the accident rate for preschool children would be higher when pressures were heaviest on the mother. We therefore recorded the occurrence of accidents in time units related to the routine of an average household (household activity periods) rather than in two-hour[1] or three-hour periods.[4] Household activity periods were defined as:

7 a.m. to 9 a.m. Family gets up and has breakfast. Father and schoolchildren leave home.
9 a.m. to noon. Mother does main household work, cleaning, washing, cooking, etc.
Noon to 2 p.m. Main meal for homecoming husband and family.
2 p.m. to 5 p.m. Mother clears up, goes to shops, park, clinic, etc.
5 p.m. to 7 p.m. Evening meal. Preschool children go to bed.
7 p.m. to 9 p.m. Schoolchildren do homework, play, watch T.V., etc.
9 p.m. to midnight. Schoolchildren in bed. Parents have chance to relax.
Midnight to 7 a.m. Rest period. Accidents infrequent.

Examination of the figures in relation to household activity periods showed that 24·9% of the accidents occurred between 9 a.m. and noon, 20·2% occurred between noon and 2 p.m., and 19·5% occurred between 2 p.m. and 5 p.m.

HOURLY AVERAGE IN PRESCHOOL CHILDREN

While there was no crop of accidents to preschool children in the early-morning rush hour in the home between 7 and 9 a.m. a high rate was found between 9 a.m. and noon (table IV). This coincided with the time when a mother does the greater part of the routine work of the day and the preschool child is most wide awake and active.

Between 10 a.m. and noon was found by McQueen[1] to be the time when most accidents occurred among the under-5s; in the B.M.A. survey[4] the highest incidence was found between 9 a.m. and noon. It seems that locally the peak accident period in preschool children occurs between noon and 2 p.m. (table IV). Though the difference in the hourly accident rate between this and other periods (in particular, 9 a.m. to noon) was not statistically significant a trend emerged which differed somewhat from the findings of the surveys referred to above. It may be the fact that it is common in a relatively compact town like Norwich for husbands to come home for a midday meal which adds to the pressure on mothers of preschool children.

TABLE IV—*Timing of Accidents to Children under Age 5*

Time	No. of Accidents	Hourly Average No. of Accidents
7 a.m. to 9 a.m.	53	26·5
9 a.m. to noon	187	62·3
Noon to 2 p.m.	151	75·5
2 p.m. to 5 p.m.	135	45·0
5 p.m. to 7 p.m.	94	47·0
7 p.m. to 9 p.m.	39	13·0
9 p.m. to midnight	13	4·3
Midnight to 7 a.m.	6	1·9

Person in Charge at Time of Accident

In 95% of the cases one or both parents were in charge at the time of the accident; in only six cases was the person in charge a teenager. No child was involved in an accident while left unattended in the house. This is in contrast to findings of the B.M.A. survey,[4] in which 1·9% of the children under 5 and 3·5% of those under 14 were alone in the house at the time of the accident. Thus in this series lack of supervision was not a factor in causing the accidents.

Type of Injury

Falls were the commonest type of accidents to the children under 5, while cuts (including abrasions and incision and puncture

TABLE V—*Type of Accident in relation to Age and Sex*

	Total		Age in Years											
			0–4				5–9				10–14			
	No.	%	M.	F.	Total		M.	F.	Total		M.	F.	Total	
					No.	%			No.	%			No.	%
Cuts	277	30·5	113	64	177	26·1	45	27	72	42·5	14	14	28	44·4
Falls	287	31·5	119	92	211	31·1	23	31	54	31·9	9	13	22	34·9
Swallowed substances	154	16·9	82	61	143	21·1	6	5	11	6·6				
Burns	45	5·0	27	11	38	5·6	4		4	2·4	2	1	3	4·8
Scalds	59	6·5	29	16	45	6·6	5	7	12	7·1		2	2	3·2
Crushed fingers	43	4·7	15	14	29	4·3	4	5	9	5·3	2	3	5	7·9
Foreign body, eyes, ears, nose	29	3·2	12	11	23	3·4	2	3	5	3·0	1		1	1·6
Miscellaneous	16	1·8	6	6	12	1·8	1	1	2	1·2		2	2	3·2
Total	910	100·0	403	275	678	100·0	90	79	169	100·0	28	35	63	100·0

wounds) were the most common among schoolchildren. The swallowing of substances constituted 21·1% of all cases of accidents to the under-5-year-olds (table V) and was responsible for half of the cases admitted to hospital. As relatively few 10 to 14-year-olds were involved the numbers in this group have no special significance.

There was a low incidence of burns (5·6%) and scalds (6·6%) in children in this series as compared with the findings of McQueen[1] (15·9% and 12·6%), the B.M.A. survey[4] (9·8% and 11·1%), and Tyser[2] (12·7% and 12·0%) (table V). About one in every 21 accidents was a case of crushed fingers, usually in doors; this hazard is, perhaps, too little recognized.

Heycock,[6] in an analysis of 377 cases of poisoning in children admitted to hospital, found that 70% of the series was accounted for by aspirin, barbiturates, laburnum seeds, camphorated oil, turpentine, iron, Domestos, Qwells, and tranquillizers. Aspirin poisoning accounted for 22% of the cases and a further 14·8% resulted from swallowing turpentine; 17% of the children had swallowed unidentified substances. Though he suggested that the risk of accidental poisoning was higher in the lower social groups we found no statistically significant evidence to support this. In our series some 15% and 8% of the cases respectively were due to swallowing aspirin and cosmetics (see table VI). Webster[7] also found aspirin to be frequently accidentally swallowed by children, 12% in her series.

TABLE VI—*Substances swallowed (154 Cases)*

	No. (%) of Cases
Drugs	
Aspirin	24 (15·6)
Other analgesics	2 (1·3)
Antibiotics	5 (3·2)
Antihistamines and antiemetics	3 (2·0)
Barbiturates and sedatives	3 (2·0)
Contraceptive pills	4 (2·6)
Iron tablets	1 (0·7)
Vitamin tablets	2 (1·3)
Miscellaneous tablets	5 (3·2)
Unspecified tablets	4 (2·6)
Cough mixture	6 (3·9)
Miscellaneous medical liquids	5 (3·2)
Unspecified ointment	1 (0·7)
Total	65 (42·3)
Household Preparations	
Cosmetics	13 (8·4)
Detergents, disinfectants, bleaches	6 (3·9)
Paint and paint stripper	6 (3·9)
Turpentine	5 (3·2)
Paraffin	4 (2·6)
Miscellaneous	11 (7·1)
Alcoholic liquids	2 (1·3)
Total	47 (30·5)
Objects	
Coins	6 (3·9)
Screws	2 (1·3)
Drawing pins	2 (1·3)
Marbles	2 (1·3)
Miscellaneous (paper clips, bacon in throat, etc.)	16 (10·4)
Total	28 (18·2)
Berries	
Cotoneaster	2 (1·3)
Elderberries	2 (1·3)
Poppy seeds	1 (0·6)
Solanum berries	1 (0·6)
Snowberries (*Symphoricarpus albus*)	1 (0·7)
Total	7 (4·5)
False Alarms	
Medical tablets	2 (1·3)
Swallowed objects	5 (3·2)
Total	7 (4·5)

Admissions to Hospital

A total of 62 children (6·8% of all cases) were admitted as inpatients for cuts (3), falls (20), swallowed substances (31), burns (2), scalds (5), and a miscellaneous condition (1).

Cause of Accidents

We could trace no report which studied the accident situation in depth with a view to seeing what preventive measures might be taken. Thus in addition to looking at the type of injury sustained we attempted to obtain information on the predisposing and immediate causes of the accidents.

Perhaps not unexpected was the fact that cuts and falls most often resulted from children playing, fighting, or misbehaving; 99 accidents were caused in this way. The next common cause was falling from bed, chair, etc (94 injuries). The following cases illustrate how accidents occur with knives and glass.

A 13-year-old boy was playing with a carving knife. His 6-year-old brother pulled it from him, cutting the older boy's hand.

A 9-year-old boy was having a sword fight with his 10-year-old brother. Knives were used for swords. The 9-year-old sustained a badly cut finger.

A 13-year-old chased his younger brother upstairs and the brother banged the bathroom door shut. It had two glass panels and the 13-year-old put his head through one of them.

Of the injuries caused by broken glass etc. some occurred when the child fell while carrying a cup or glass.

The cases of swallowed substances (table VI) included 53 in which the child had ingested medical tablets which were within reach. It is, perhaps, difficult for parents to appreciate that a 2-year-old can climb on to the bath and take "junior" aspirin tablets kept in an unlocked medicine cabinet above the bath, but 2- and 3-year-olds can and do move chairs and climb on furniture to reach cupboards, shelves, and unlocked cabinets when mother is out of the room. There is obviously no safe storage space except the locked cupboard. Nor when it comes to household substances is it likely, for example, that parents would have anticipated that a 22-month-old child would swallow paraffin left about the house in a container with a screwtop. And even when parents do take all precautions it still seems there are loopholes. It may be that copying the grown-ups was a causal factor in the case of a 3-year-old boy who was admitted to hospital after drinking half a bottle of cherry brandy, and that of an 8-year-old, also admitted from the casualty department, who after going downstairs on a Sunday morning spree when his parents were asleep drank a bottle of port.

However conscientious parents may be and however effective any health education programmes there is an element of unpredictability and an area where possible danger cannot be foreseen. Such was the case of a 3-month-old baby who was injured while held in his mother's arms. A gust of wind blew open the back door of the house causing a cupboard door by which the mother was standing to open violently, hitting the baby's head and fracturing its skull. Not only did this distress the parents but it was quite justifiably suspected by the casualty officer of being a case of baby battering. When the health visitor made inquiries, however, she found that it was an accident which could not possibly have been foreseen.

We are greatly indebted to the health visitor assistants and health visitors for their painstaking work in following up the cases and completing the involved questionnaires. Our thanks are also due to Mr. D. E. Lee for his statistical appraisal. We are indeed fortunate in the co-operation which we have received over the years, and continue to receive, from the hospital authorities in notifying us of home accidents.

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